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3. Full name, address and postcode of the or of each patent applicant (underline all surnames)
Gemstar Development Limited
14 Blacklands Terrace
LONDON SW3 2SP

Patents ADP number (if you know it)

07730740001

If the applicant is a corporate body, give the country/state of its incorporation

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4. Title of the invention
An Interactive Television System

5. Name of your agent (if you have one)
"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)
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- a) any applicant named in part 3 is not an inventor, or
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- c) any named applicant is a corporate body. See note (d))

An Interactive Television System

The present application relates to an interactive television system. The application additionally relates to a call management system that uses a display screen, typically on a television, and a telephone.

For a number of years, systems that provide interactive and transactional electronic services for television viewers have been available. Typically, these systems comprise set-top-boxes (e.g. WebTV) and lap-top or keyboard device browsers that are plugged into a television in order to display the services and additionally a telephone or cable socket in order to establish a communication link with a remote service provider. The interactive services that are provided can, in some systems, be accessed using electronic programme guides (EPG) that are incorporated into receiving platforms such as set-top-boxes, video recorders or televisions.

The availability of EPG systems has greatly improved the ability of television viewers to find and record television programs of interest. EPG systems, such as GuidePlus Gold™ marketed by Gemstar Development Corporation in the United States, download TV listing information from broadcasters and display them interactively according to viewers' individual needs. In most cases, viewers interact with the EPG system by keying instructions into a handheld, infra-red (IR) remote control unit (IR remote). When EPG systems support a range of interactive information and transaction services, it is necessary to provide data communication return paths from viewers to service providers, typically via the public switched telephone network (PSTN).

In order to provide a data return path to service providers via the PSTN, a connection is required between the EPG and a telephone socket. Hence, viewers frequently face the inconvenience of having to either install an extension telephone cable or relocate their television set because the TV and telephone are seldom located together in the same room. However, as prices fall, consumers are increasingly buying digital cordless telephones, which normally comprise a base unit and a portable telephone handset. The base unit is connected to the public switched telephone network (PSTN) via a socket in the telephone user's home and establishes a digital wireless data link with the hand set. Use of such cordless telephones eases the problems associated with the location of the television.

Interactive systems that use cordless telephones and televisions are already known. For example, WO 96/13933 discloses an apparatus that combines the functionality of a cordless telephone handset and a remote control unit for appliances such as a television or a video recorder. WO 97/31480 describes a system in which a two-way communication link is provided between a television and a service provider via a cordless telephone base unit. There is, however, a need to improve these systems to provide an effective, but increasingly simple interface to allow a user to interactively select and use features provided by service providers.

In addition, whilst digital cordless telephones offer greater clarity of speech and range than their counterparts, many telephone features, such as a contact telephone number list, and services, such as call line identification, another party on-line, conference calling, display of account information etc., are difficult to implement because users must memorise multiple key sequences in

order to operate them. This is a disadvantage. There is, therefore, a need to improve the provision of telephone features and services generally and in particular for cordless telephones.

5 An object of the present invention is to provide an interactive television system that improves the functionality of the known systems described above.

Another object of the invention is to provide an interactive call management system that overcomes some of the disadvantages associated with telephones
10 and in particular cordless telephones.

According to one aspect of the present invention, there is provided a system comprising a handset that is operable to establish an audio telephonic link, a display separate from the handset, a communication link between the handset
15 and the display, and means for presenting an offer of information from a service provider on the display, wherein the handset comprises means for interactively requesting the information offered, whereupon making that request an audio telephonic link is automatically established between the handset and the service provider.

20 The means for presenting an offer of information from a service provider on the display may present an advert or cue or icon, which may be part of an EPG or presented simultaneously with a real time broadcast. The advert may be presented as a panel in a portion of the EPG. Users may flag a logical interest
25 response to such an ad panel by selecting and pressing an appropriate soft action key on the handset (e.g. "Yes"). Typically, the ad panel is downloaded

with the EPG. Updated ad-panels or icons may be downloaded separately from the EPG.

5 Ad panels and/or cues and/or icons may be pre-loaded in a memory and triggered for display at a particular time or downloaded to the user in a real time broadcast.

10 Preferably, a telephone number is downloaded with the advert panel, which telephone number is dialled automatically when a user requests information, thereby to establish a telephone link between the handset and the service provider.

The use of a telephonic advert panel is advantageous because it allows a user to set up automatically a direct telephone voice call to a predefined number.
15 When a telephonic panel is selected, the user may be given the option to make a voice call to a number specified by the advertiser.

The display screen may be that of a television or computer or any other appliance.
20

The communication link between the handset and the display, and the means for presenting an offer of information from a service provider may be provided in a control module that may be a discrete unit or provided in an appliance such as a television or some other television accessory. The control module may include
25 a cradle that is connected to a power supply and is adapted to receive the handset, so that the handset can be re-charged.

The telephone link may be set up from the control module over a command channel to the remote handset 18, which causes the relevant telephone number to be dialled.

5 The handset is preferably a wireless handset. Preferably, the handset has the functionality of a cordless telephone. Preferably, the handset is operable to control the functionality of the display and/or any other appliance that is connected thereto.

10 The telephone link may be established over the public switched network (PSTN). The handset may be in communication with a base unit that is connected to the PSTN, preferably wireless communication.

15 According to another aspect of the present invention, there is provided an interactive call management system comprising a handset that is operable to establish an audio telephonic link, a display separate from the handset, a communication link between the handset and the display, and means for presenting information relating to telephone services on the display, wherein the handset comprises means for interactively entering requests for information on
20 the screen.

The display may be the screen of a television or computer or any other appliance. The handset is preferably adapted to control the television or other appliance.

25 The means for presenting information may be adapted to present telephone directory information, such as yellow pages information. A memory may be

provided for storing lists of telephone numbers. The list may be arranged by the user in order to provide a personalised or customised list. A cursor or marker may be provided that can be moved about the display using the handset. When the list is presented on the display, a particular number can be selected for dialling by marking it with the cursor or marker and then pressing an appropriate button on the handset to cause automatic dialling of the number. The directory may comprise a list of service providers that have advertised on the display.

Means may be provided for receiving and interpreting signals sent to the handset, in order to provide the names and numbers of incoming callers on the display, which are typically captured using a call line identification (CLI) feature. Optionally, a voice message may be taken, and then played back. The number of the incoming caller may be annotated with a name and added to the list that can be presented on the display. Names may be highlighted on the list and dialled when selected from the TV screen.

Means may be provided for implementing an electronic program guide and/or another graphical user interface for presentation to the viewer, wherein the user interacts with the call management system through the graphical user interface.

The communication link between the handset and the display, and the means for presenting an offer of information from a service provider on the display screen may be provided via a control module that is separate from other components of the system or in a television or some other television accessory.

The handset is preferably wireless. Preferably, the handset has the functionality of a cordless telephone. Preferably, the handset is operable to control the functionality of the display and/or any other appliance that is connected thereto.

- 5 The telephone link may be established over the public switched network (PSTN). The handset may be communication with a base unit that is connected to the PSTN, preferably wireless communication.

10 Various systems in which aspects of the invention are embodied will now be described by way of example only and with reference to the accompanying drawings, of which:

Figure 1 is diagrammatic representation of an interactive telephone/television system in which the control module is provided separately from the television;

Figure 2 is diagrammatic representation of an interactive telephone/television system in which the control module is provided in the television;

Figure 3 is a circuit diagram of a control module of the system of Figure 1;

Figure 4 is a front view of a handset;

Figure 5 is a view of the key layout of the handset of Figure 3;

Figure 6 is an example of a television screen on which is shown a broadcast program and additionally a caption indicating the name and number of an incoming telephone call, and

Figure 7 is an example of an electronic program guide.

Figure 1 shows a control module 10 that is connected to a television 12 via a SCART cable 14 and via a wireless communication link 15, typically an IR link, to each of the television 12, a video recorder 16 and a remote handset 18. Connected to the remote handset 18 via a wireless communication link, typically an IR or RF link, is a base unit 20 of a cordless telephone, which is in turn connected via a wireless link to a cordless telephone handset 22.

Communication between the remote handset 18 and the control module 10 is bi-directional, as is communication between the handset 18 and the base unit 20, thereby allowing the provision of interactive services.

The example shown in Figure 2 is similar to that of Figure 1, except that the control module 10 is provided in the television set 12, rather than being a discrete device. The control module 10 could of course, alternatively be provided in the VCR 16. In either case, the control module 10 acts as the central controller of the overall system.

In Figure 1, the control module is connected between the TV 12 and input video devices, such as the VCR 16 or pay-TV decoder via a SCART IN 24 socket, as shown in Figure 3. Video and sound are output from the control module 10 to the television 12 via a SCART OUT socket 26. Broadcast data is received via the RF IN socket 28. In order to allow the module 10 to control the television 12, video recorder 16 or any other such device, an IR transmitter 30 is provided to give uni-directional control. Also provided is an IR transceiver 32 to receive commands from the remote handset 18. All commands and data from the remote handset 18 are received in infra red data (IrDa) link protocol.

Included in the control module 10 is a central processor 34 that stores and runs software for implementing an electronic program guide (EPG) and other graphical user interface (GUI) facilities, such as call management facilities for the user's telephone, for display on the television screen. Connected to the central processor 34 is a programmable tuner 36 that is operable to receive information for the EPG that is broadcast periodically, typically in the vertical blanking interval (VBI). This information is forwarded to the central processor 34 in order to ensure that information in the EPG presented to the user is up to date.

Connected to the programmable tuner 36 is a picture in picture or picture in guide circuit 38. When the electronic program guide is in use, the programmable tuner 36 can optionally be tuned to the channel to which the television 12 was tuned when the EPG was called up to the screen. The signal from the programmable tuner 36 is then passed through the picture in guide/picture circuit 38 and scaled down to a size that is smaller than normal. The reduced size image is then forwarded to the central processor 34 where it is combined with the EPG and displayed in a portion of the screen. In this way, a user can view simultaneously the EPG and the program that was previously being watched. As another option, the programmable tuner 36 and circuit 38 could be used to present a reduced size image of a currently broadcast program over a portion of a normal sized image of a different currently broadcast program.

In addition to providing control facilities for the television 12, the control module 10 also controls the video recorder 16. In order to facilitate unattended recording, a program delivery control (PDC) or VPS decoder is connected to

the central processor 34. This allows the system to monitor when a program is about to be broadcast, prepare the video recorder 16 and then switch it on when the program begins.

5 Included in the central processor 34 is a universal remote control or emulator for converting command signals from the remote handset 18 to signals that are recognisable by each of the various appliances. In this way, only a single remote control 18 is needed. This simplifies use of the system for the user.

10 The control module 10 is powered up 24 hours per day to support instant emulation of all television 12, video recorder 16 and set top box control commands received from the handset 18 and to allow detection of program delivery controls (PDC) and VPS labels.

15 As previously mentioned, the central processor 34 is provided with software for implementing a graphical user interface (GUI). In order to provide a call management system to the user, a call management GUI is arranged to allow the user to readily access and use common telco provided services, typically including:

20

- Caller display: the number and name of the present caller is displayed on the screen, by for example matching the number of the caller against numbers associated with names stored in memory;
- Call return: the number and name of the last caller is displayed;
- Call waiting: a flag is displayed on the screen when someone is trying to

25

call the user, and enables/disables service;

- Call diversion: calls are diverted to an entry in a contact management function;
- Three way calling.

5 The GUI may additionally be adapted to present telephone directory information, such as yellow pages information. A memory may be provided, for example in the central processor 34, for storing lists of telephone numbers. The GUI is such that the list can be arranged by the user in order to provide a personalised or customised list. Within this list, a cursor or marker is provided

10 that can move about the display using the remote handset 18. When the list is presented on the display, a particular number can be selected for dialling by marking it with the cursor or marker and then pressing an appropriate button on the handset 18 to cause automatic dialling of the number.

15 Information and commands are input into the central processor 34 via the graphical user interface such as the call management interface described above or an EPG, which is presented to the user. Commands are entered using the remote handset 18, which comprises a digital cordless telephone handset that is supplemented with an enhanced keyboard and an infra-red data (IrDa) modem

20 capability. The remote handset 18 acts as a data link interface between the control module 10 and the base unit 20 of the cordless telephone. The remote handset 18 may additionally provide a link between a telephone or communication network, such as the PSTN, and other appliances that are fitted with compatible interfaces. For example the handset may provide a portable

25 modem interface for notebook computers.

The remote handset has the functionality of a cordless telephone, in that telephone calls received at the base unit 20 are forwarded via a wireless connection to the handset 18. However, it additionally comprises an IR transceiver to allow two way communication with the control module 10. In
5 summary, the handset 18 includes the following:

- a. Telephone microphone and ear-piece;
- b. A character alphanumeric LCD display;
- c. Batteries;
- 10 d. Bi-directional IrDA transceiver;
- e. Error corrected data transfer with control module at rates up to 38kbit/s;
- f. DECT 1.9GHz data and telephone transceiver for data and voice communication with the base unit of the cordless telephone.

15 The keypad 44 is similar to a cordless telephone keypad, but the buttons 45 are mapped to allow easy control of the television 12, including EPG and teletext, and video recorder 16. Figures 4 and 5 show an example of the layout of the keypad 44, which has five rows of three buttons.

20 Provided in the top row is a MODE button 46 that toggles between control of different devices. Mode 1 sets the handset 18 to act as if it were a standard cordless telephone. Mode 2 allows the user to interface with the control module 10 and can activate electronic program guide facilities. Mode 3 allows the user to swap the television 12 between video and teletext modes of operation. Mode

4 allows control of the video recorder 16 from a pop-up, virtual keypad that is displayed on the television screen by the central processor 34.

As will be appreciated, various other modes could be provided in order to allow
5 the remote handset 18 to control other external devices.

Pressing the mode button causes the selected device name to appear in the handset display. Alphabet characters may be entered by repeat presses to cycle to desired character and case (e.g. "m" by pressing "6" quickly twice, "M" by
10 pressing "6" three times – in the sequence "6mMnNoO"). Once the desired mode is selected, control of the appliances connected to the control module 10, such as the television 12 or the video recorder 16 is via a virtual keypad that is generated by the central processor and displayed on the television screen. Provided in this virtual keypad is a cursor or marker that can be moved to the
15 desired position on the virtual keypad using the CursorUp, CursorDown, CursorLeft and CursorRight buttons on the remote handset keypad 44. Once the cursor is positioned at the required position, the function highlighted can be selected by pressing the button marked "OK".

20 When the functions or features selected by the viewer are interactive and require a signal to be sent over the PSTN, DTMF pulses are generated by the control unit 10 to emulate the equivalent when manually keyed into a normal telephone handset. In this way, the user can select and utilise telephone functions that are displayed on the television screen, which functions generate
25 signals that are automatically converted into code that is recognisable by the telephone base unit 20.

The control module 10 is operable to receive and interpret signals sent from the telephone base unit 20, in order to provide the names and numbers of incoming callers on the television display. Optionally, a voice message may be taken, and then played back when the television sound is muted. The voice message may be stored in a memory that may be provided in the control unit 10 or the television 20.

The control unit 10 is further adapted so that a user can manually press a button to capture the number of an incoming caller and display it on the TV in a caption 48, as shown in Figure 6, simultaneously with a real time broadcast. This may then be annotated with a name and added to a list, which can be displayed on the screen as and when desired. Names may be highlighted and dialled automatically off the TV screen.

As previously mentioned, the control module 10 is additionally arranged to implement an EPG 50, an example of which is shown in Figure 7. This has a grid with time 52 along the horizontal axis and channel 54 on the vertical axis. Program titles 56 are provided in cells 58 that are located within the grid so that a viewer can tell at a glance on which channel a program is to be broadcast and at what time.

Presented in the bottom left hand corner of the EPG is a "telephonic ad panel" 60 that allows a user to set up automatically a direct telephone voice call to a predefined number downloaded with the ad-panel. When the telephonic panel 60 is selected, an action key gives the user the option to make a voice call to a

number specified by the advertiser. Users may flag a logical interest response to an ad panel by selecting and pressing the appropriate soft action key (e.g. "OK") on the remote handset 18. The telephone link is set up by sending a command signal from the control module 10, in response to a selection by the viewer, to the remote handset 18 and from there, over the IrDa link, to the base unit 20 where the relevant telephone number is dialled. The user is then able to communicate orally with the service provider using the remote handset 18.

To spread the load on customer call centres, call response ad-panels 60 can be controlled to appear at random during time window periods downloaded with the ad-panel. Instead of ad-panels, icons or cues could be presented to the user, either with the EPG or with a real time broadcast.

While most EPG information is broadcast at specific times, users may want to receive immediate updates on certain types of information before the next scheduled broadcast. Such information is highlighted with a different background. It may be updated by the pressing an "update" key to initiate a data link via the remote handset between the control module and a remote server.

The control module 10 may contain a hypertext web browser and e-mail client software. In addition to supporting links to text, graphics and other objects, the control module may support "telephonic" hypertext links. Clicking on a telephonic link within a web page or e-mail will cause the control module 10 to command the remote handset 18 to dial a telephone number, in the same way as for telephonic response ad-panels.

Whilst the system described with reference to Figures 1 and 2 has a video recorder and television connected to the control module, it will be appreciated that the module could equally be used to control many other appliances such as, for example, a satellite or cable decoder, a DVD player and any video time shift and display device.

Integration of television and video recorder remote control functions with a cordless telephone handset to form an integrated remote handset as described above allows a user to interact with an EPG and improves the functionality of the overall system. This is advantageous.

Integration of a telephone handset into a remote control for a graphical user interface provides a call management system that can be readily operated by a user.

The embodiments above are described by way of example and are only to be considered preferred and illustrative of the inventive concepts disclosed. The scope of the invention is not to be restricted to the embodiments. Various and numerous other arrangements may be devised by one skilled in the art without departing from the spirit and scope of this invention.

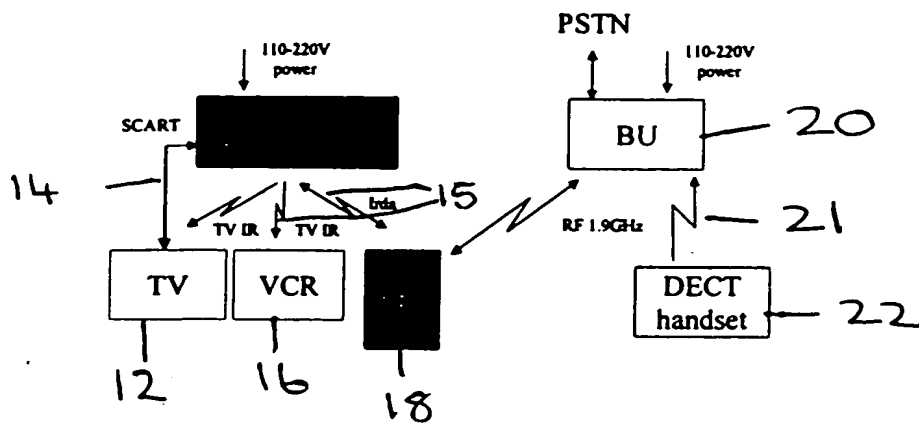


Figure 1

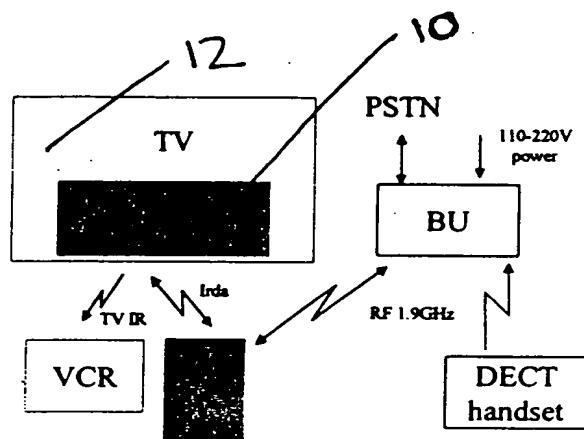


Figure 2

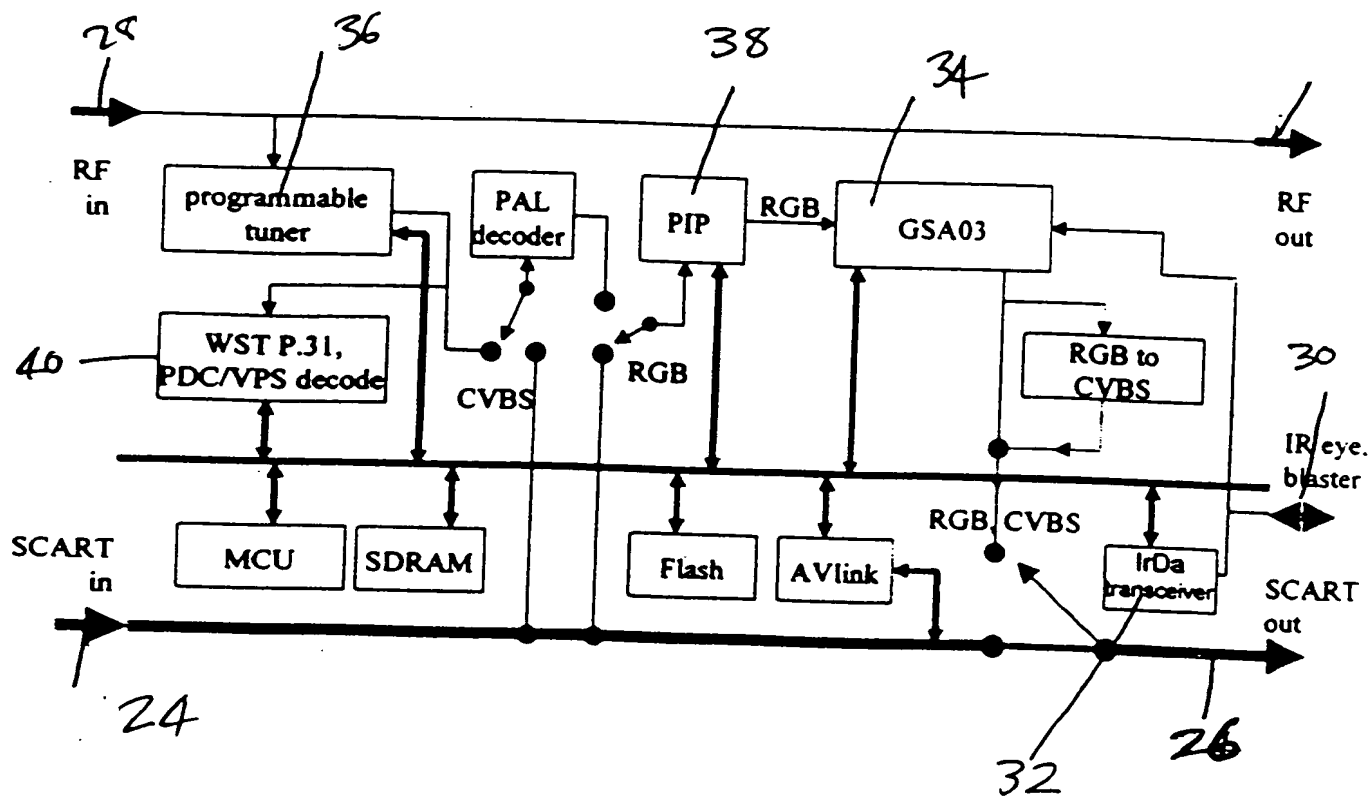


Figure 3

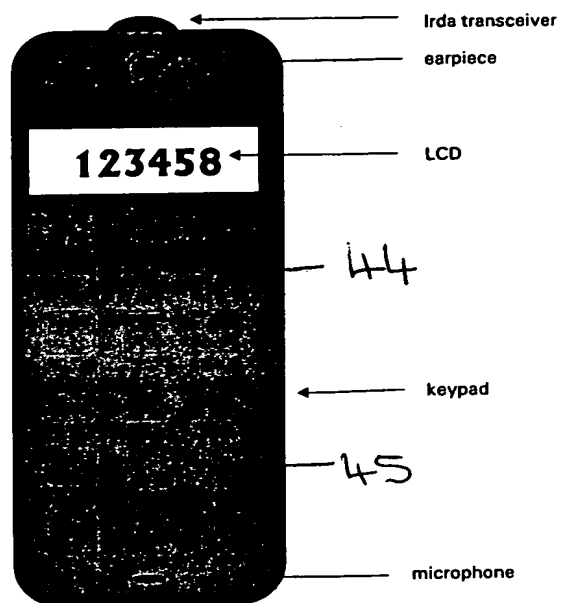


Figure 4

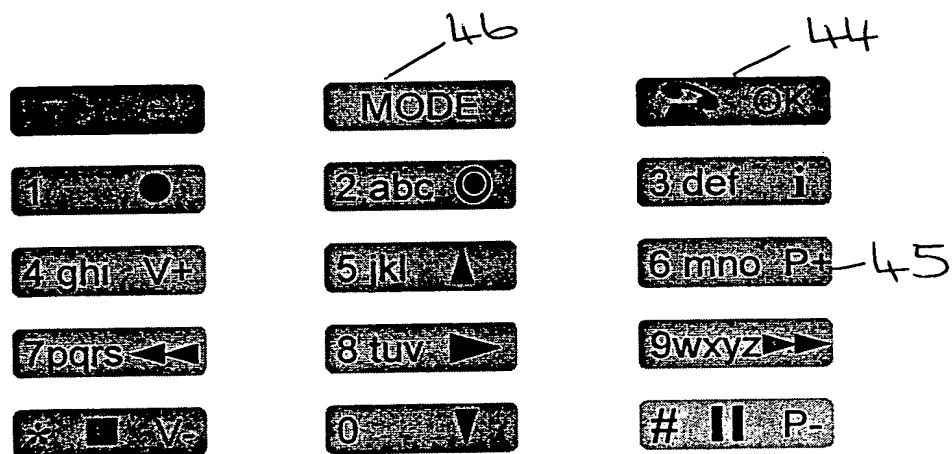


Figure 5

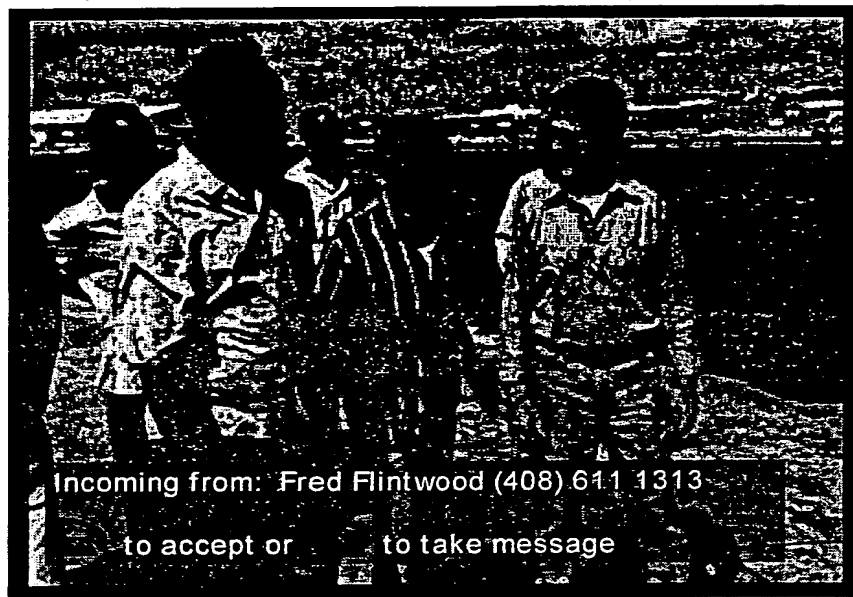
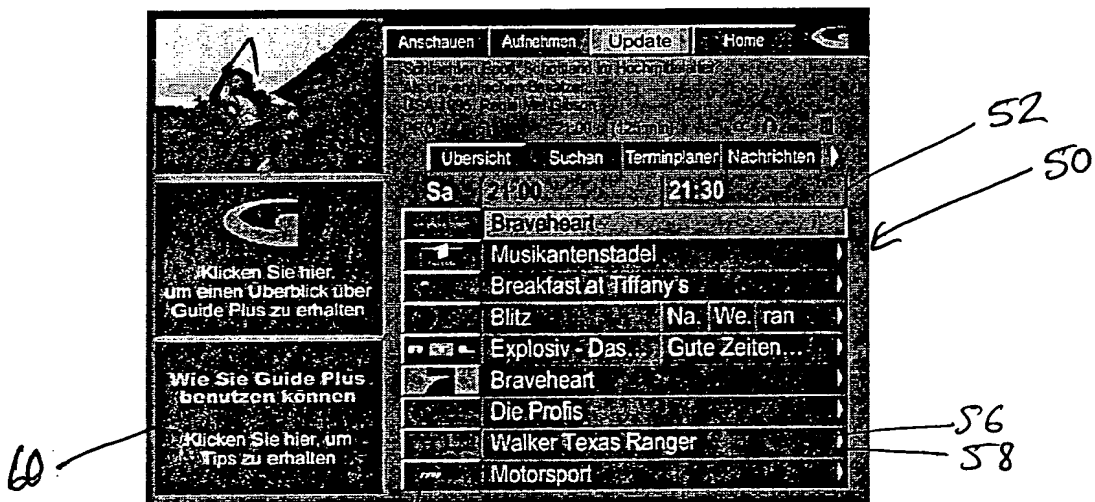


Figure 6



54
Figure 7

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